FIG.1

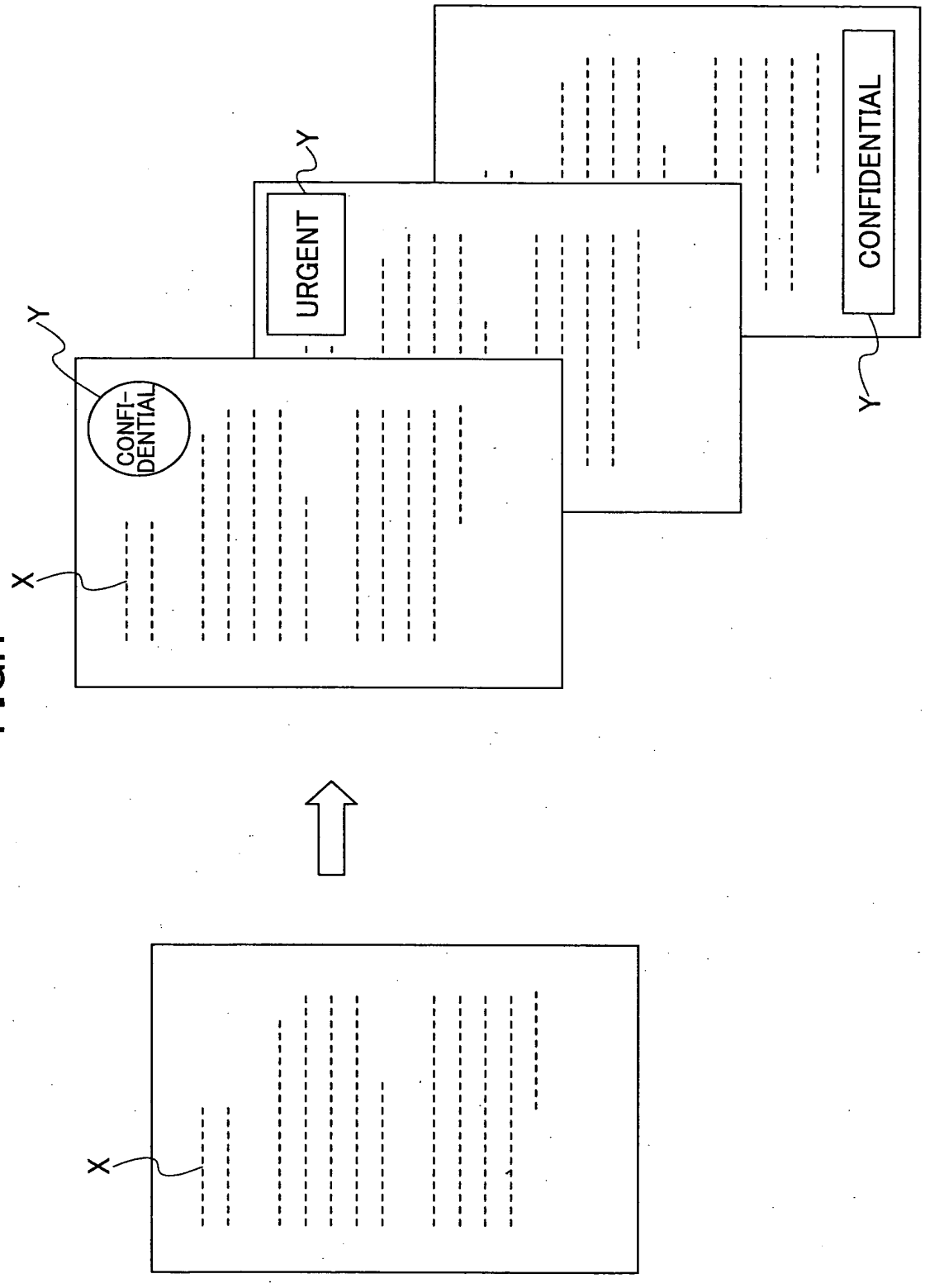


FIG.2

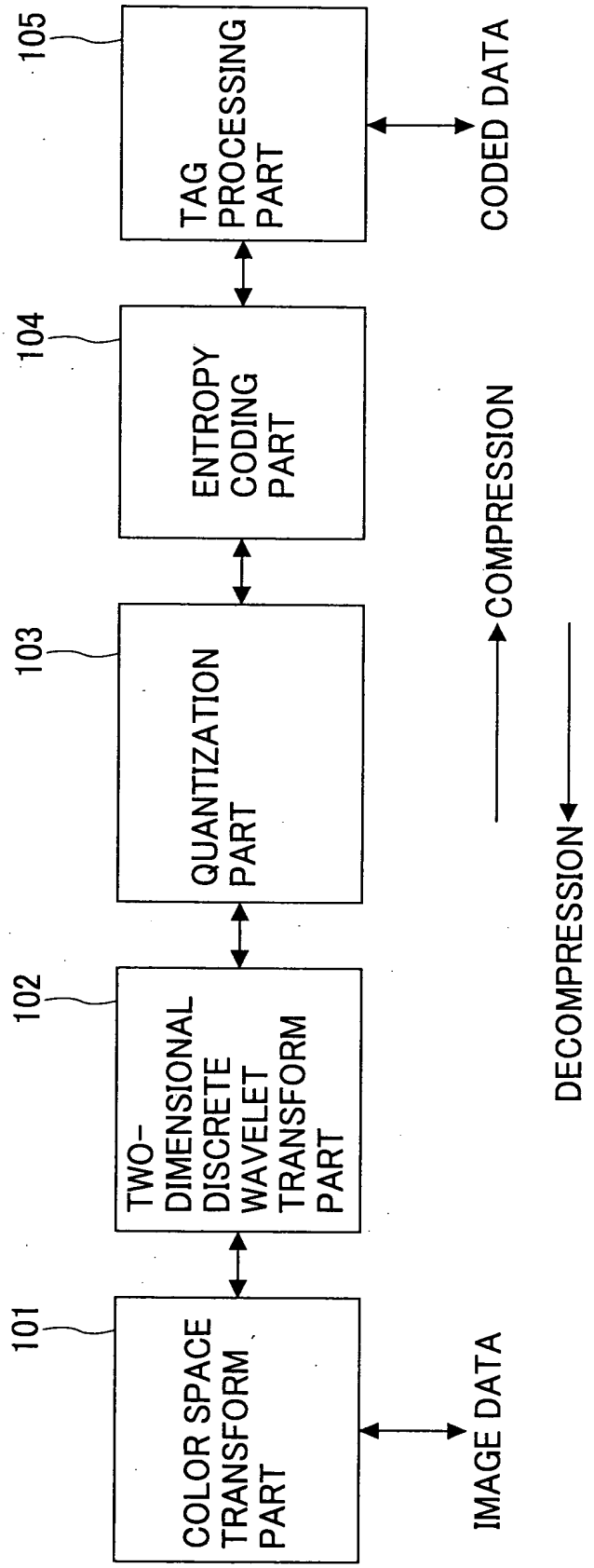

105
TAG PROCESSING PART
CODED DATA
104
ENTROPY CODING PART
103
QUANTIZATION PART
COMPRESSION
DECOMPRESSION
102
TWO-DIMENSIONAL DISCRETE WAVELET TRANSFORM PART
101
COLOR SPACE TRANSFORM PART
IMAGE DATA

FIG.3

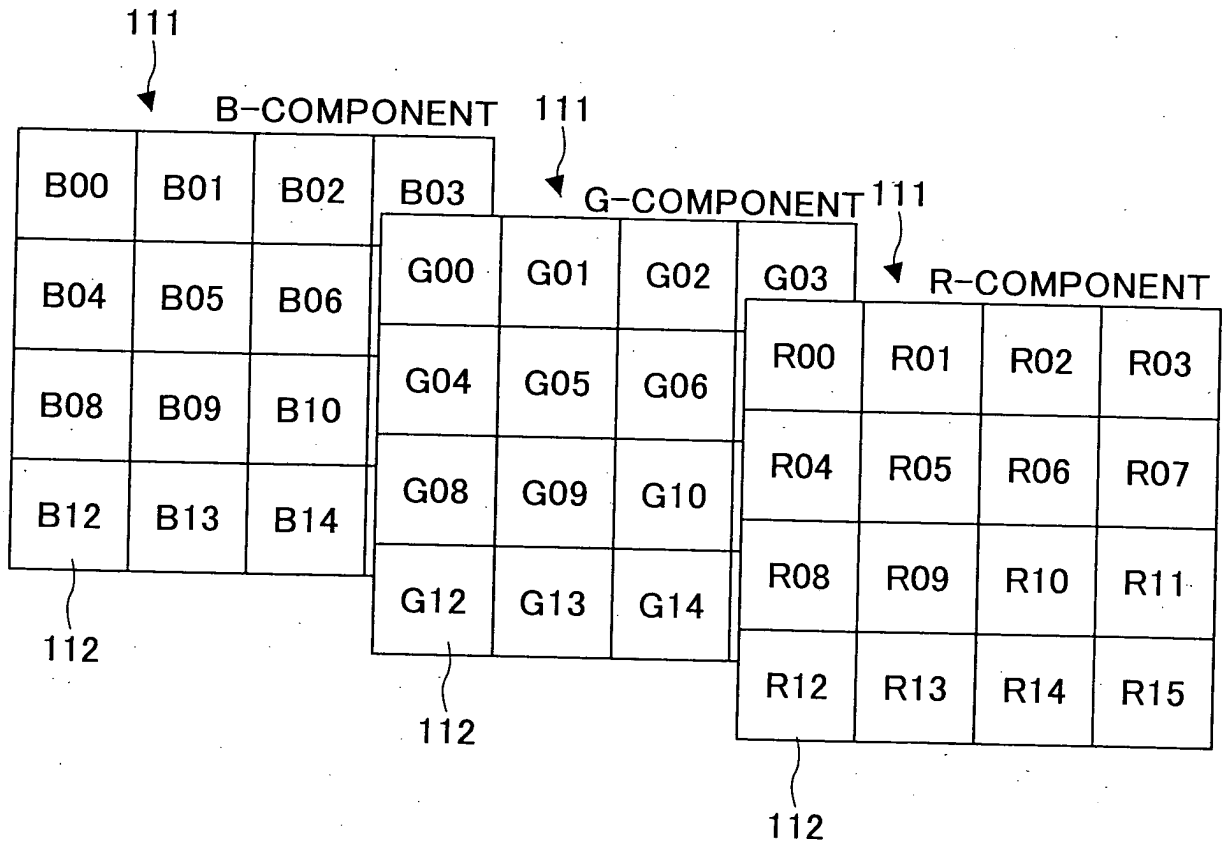
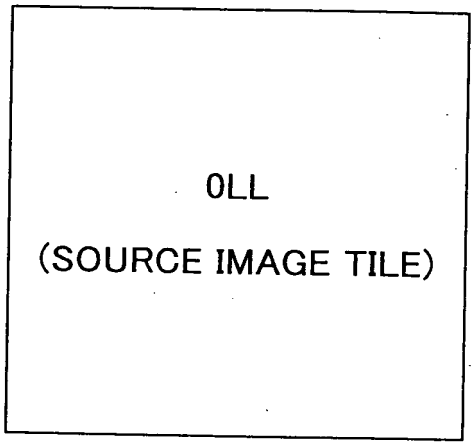
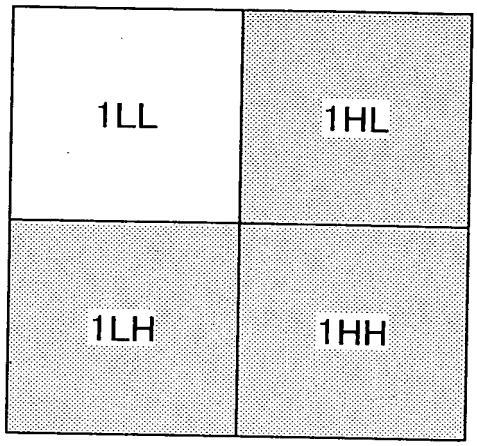

111
B-COMPONENT
111
G-COMPONENT
111
R-COMPONENT
B00
B01
B02
B03
B04
B05
B06
B08
B09
B10
B12
B13
B14
G00
G01
G02
G03
G04
G05
G06
G08
G09
G10
G12
G13
G14
R00
R01
R02
R03
R04
R05
R06
R07
R08
R09
R10
R11
R12
R13
R14
R15
112
112
112

FIG.4A



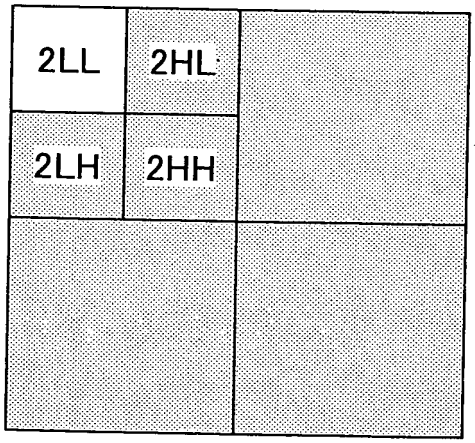
DECOMPOSITION_LEVEL_0

FIG.4B



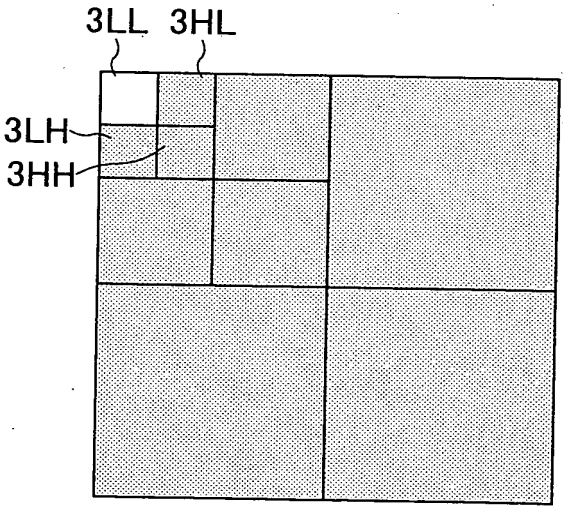
DECOMPOSITION_LEVEL_1

FIG.4C



DECOMPOSITION_LEVEL_2

FIG.4D



DECOMPOSITION_LEVEL_3

FIG.5

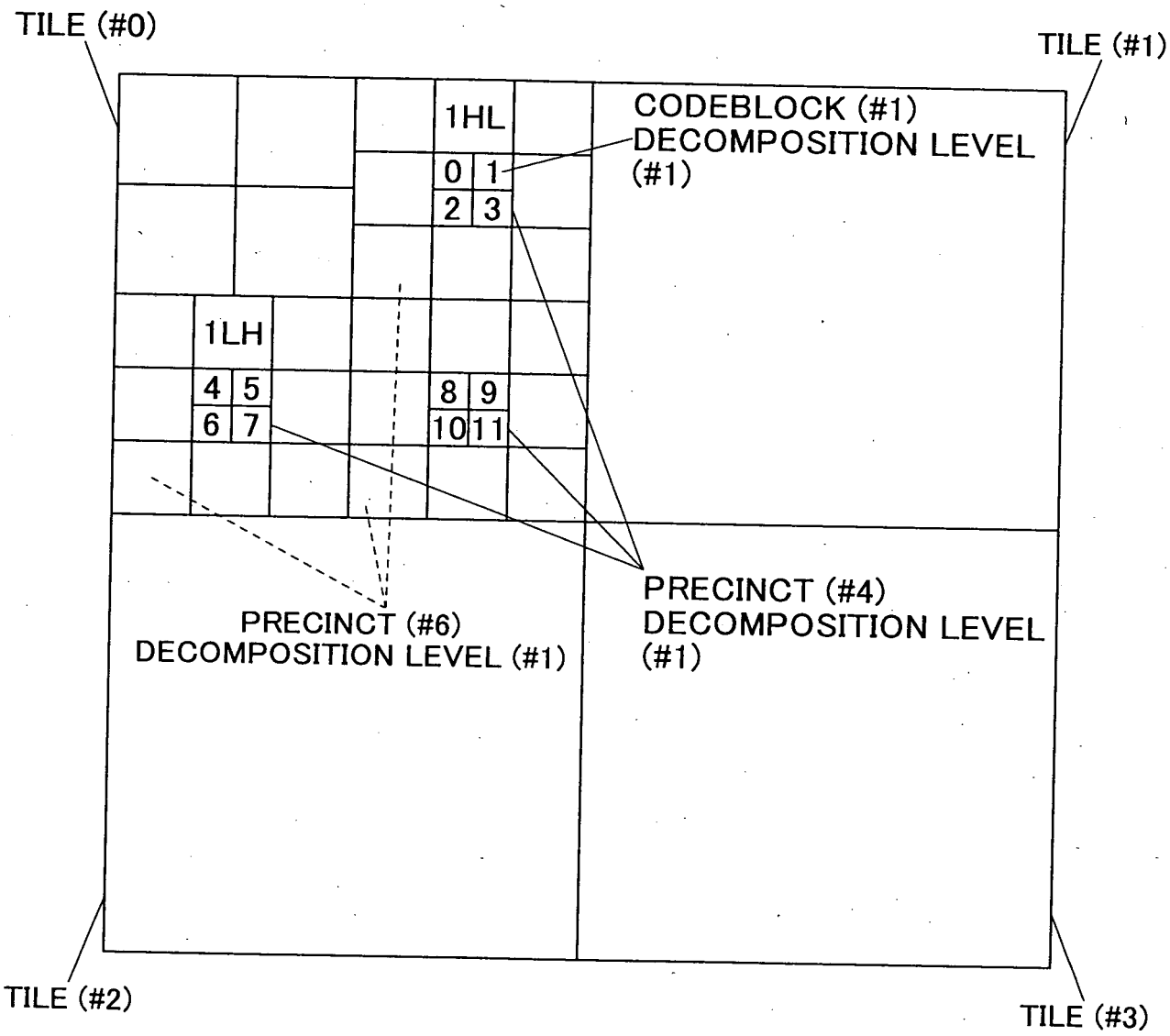

TILE (#0)
TILE (#1)
1HL
0 1
2 3
CODEBLOCK (#1)
DECOMPOSITION LEVEL
(#1)
1LH
4 5
6 7
8 9
10 11
PRECINCT (#4)
DECOMPOSITION LEVEL
(#1)
PRECINCT (#6)
DECOMPOSITION LEVEL (#1)
TILE (#2)
TILE (#3)

FIG.6

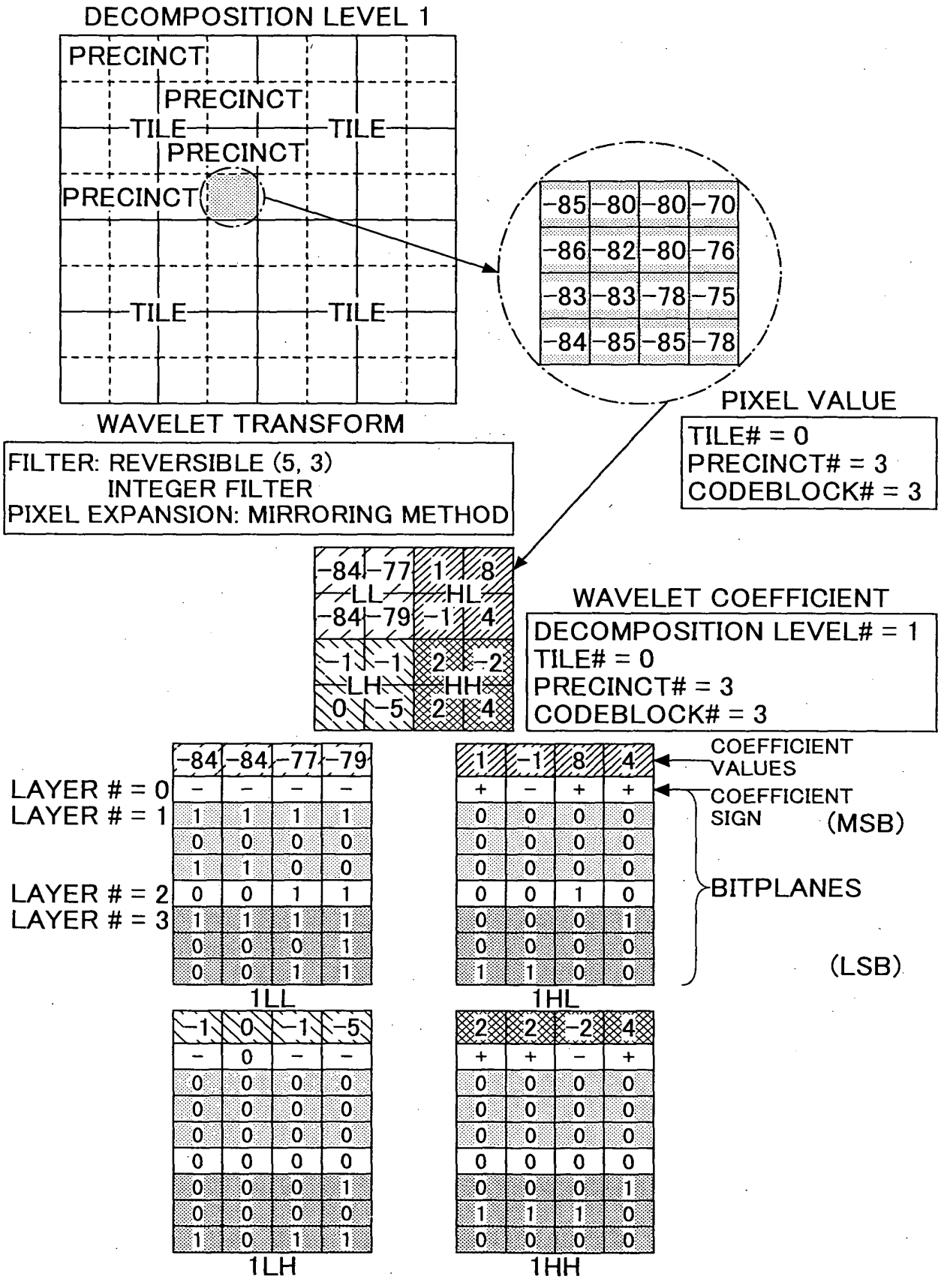

DECOMPOSITION LEVEL 1
PRECINCT
PRECINCT
TILE
TILE
PRECINCT
PRECINCT
TILE
TILE
-85 -80 -80 -70
-86 -82 -80 -76
-83 -83 -78 -75
-84 -85 -85 -78
PIXEL VALUE
TILE# = 0
PRECINCT# = 3
CODEBLOCK# = 3
WAVELET TRANSFORM
FILTER: REVERSIBLE (5, 3)
INTEGER FILTER
PIXEL EXPANSION: MIRRORING METHOD
-84 -77 1 8
LL HL
-84 -79 -1 4
-1 -1 2 -2
LH HH
0 -5 2 4
WAVELET COEFFICIENT
DECOMPOSITION LEVEL# = 1
TILE# = 0
PRECINCT# = 3
CODEBLOCK# = 3
LAYER # = 0
LAYER # = 1
LAYER # = 2
LAYER # = 3
-84 -84 -77 -79
1LL
1 -1 8 4
1HL
COEFFICIENT VALUES
COEFFICIENT SIGN
(MSB)
BITPLANES
(LSB)
-1 0 -1 -5
1LH
2 2 -2 4
1HH

FIG.7

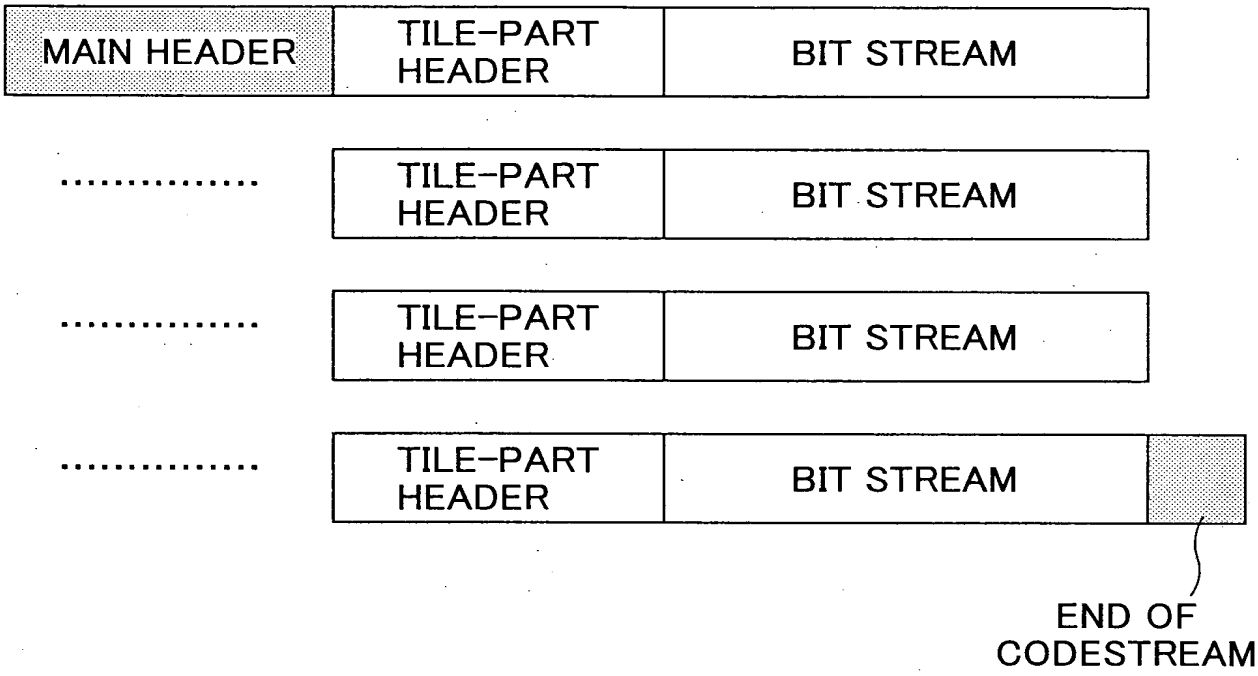

MAIN HEADER
TILE-PART HEADER
BIT STREAM
TILE-PART HEADER
BIT STREAM
TILE-PART HEADER
BIT STREAM
TILE-PART HEADER
BIT STREAM
END OF CODESTREAM

FIG.8

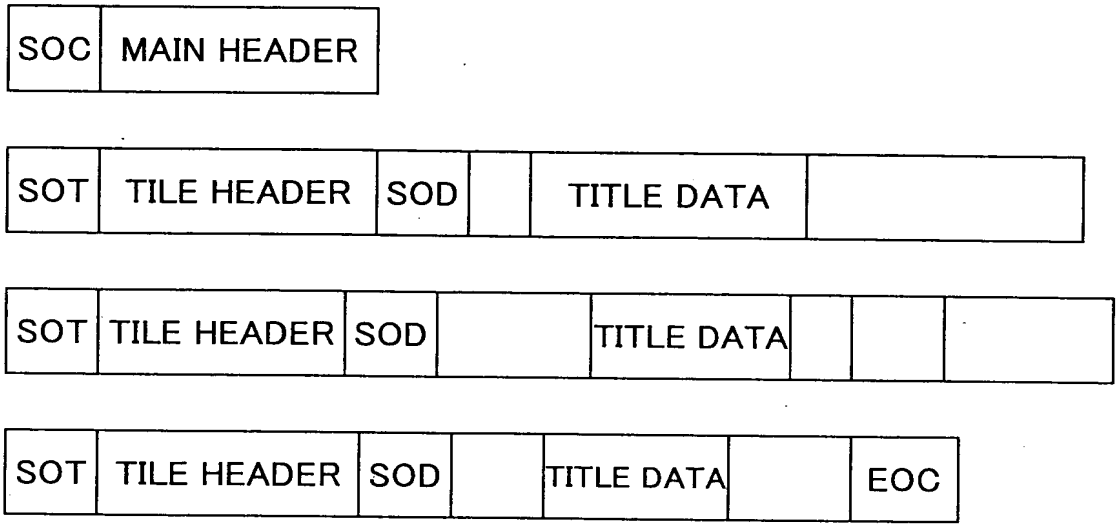

SOC
MAIN HEADER
SOT
TILE HEADER
SOD
TITLE DATA
SOT
TILE HEADER
SOD
TITLE DATA
SOT
TILE HEADER
SOD
TITLE DATA
EOC

FIG.9

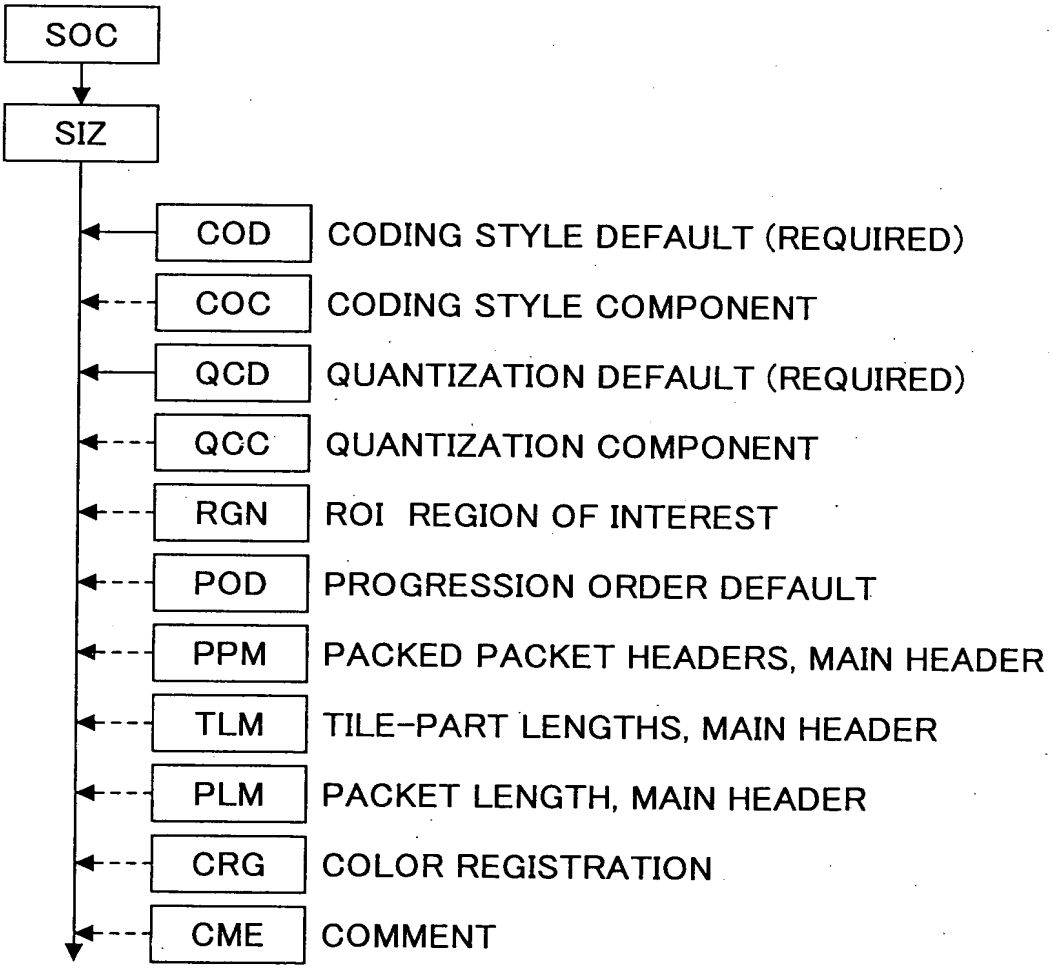

SOC
SIZ
COD
CODING STYLE DEFAULT (REQUIRED)
COC
CODING STYLE COMPONENT
QCD
QUANTIZATION DEFAULT (REQUIRED)
QCC
QUANTIZATION COMPONENT
RGN
ROI REGION OF INTEREST
POD
PROGRESSION ORDER DEFAULT
PPM
PACKED PACKET HEADERS, MAIN HEADER
TLM
TILE-PART LENGTHS, MAIN HEADER
PLM
PACKET LENGTH, MAIN HEADER
CRG
COLOR REGISTRATION
CME
COMMENT

FIG.10A

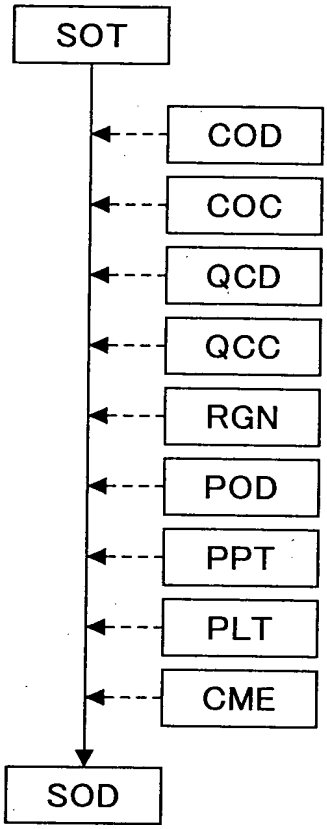


FIG.10B

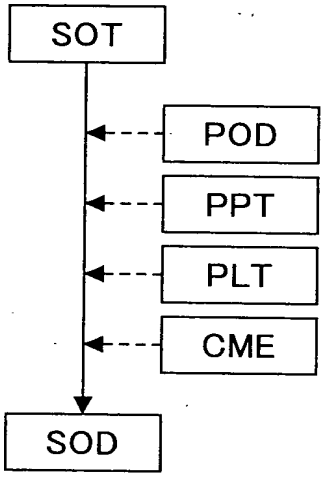


FIG.11

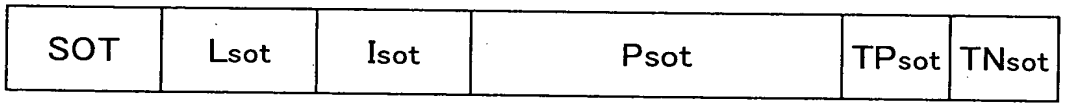


FIG.12

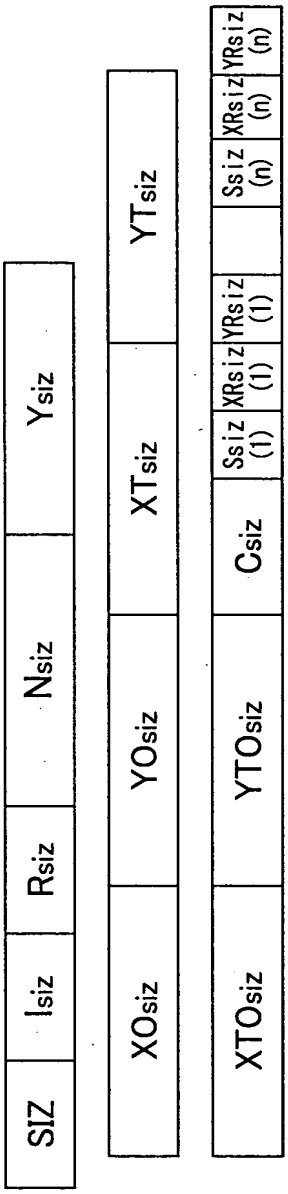

SIZ
Isiz
Rsiz
Nsiz
Ysiz
XOsiz
YOsiz
XTsiz
YTsiz
XTOsiz
YTOsiz
Csiz
Ssiz (1)
XRsiz (1)
YRsiz (1)
Ssiz (n)
XRsiz (n)
YRsiz (n)

FIG.13

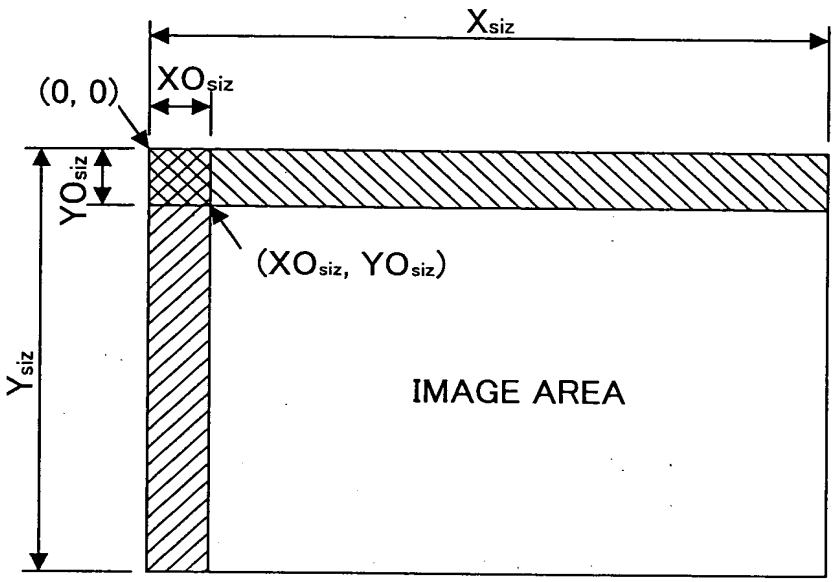

Xsiz
XOsiz
(0, 0)
YOsiz
(XOsiz, YOsiz)
Ysiz
IMAGE AREA

FIG.14

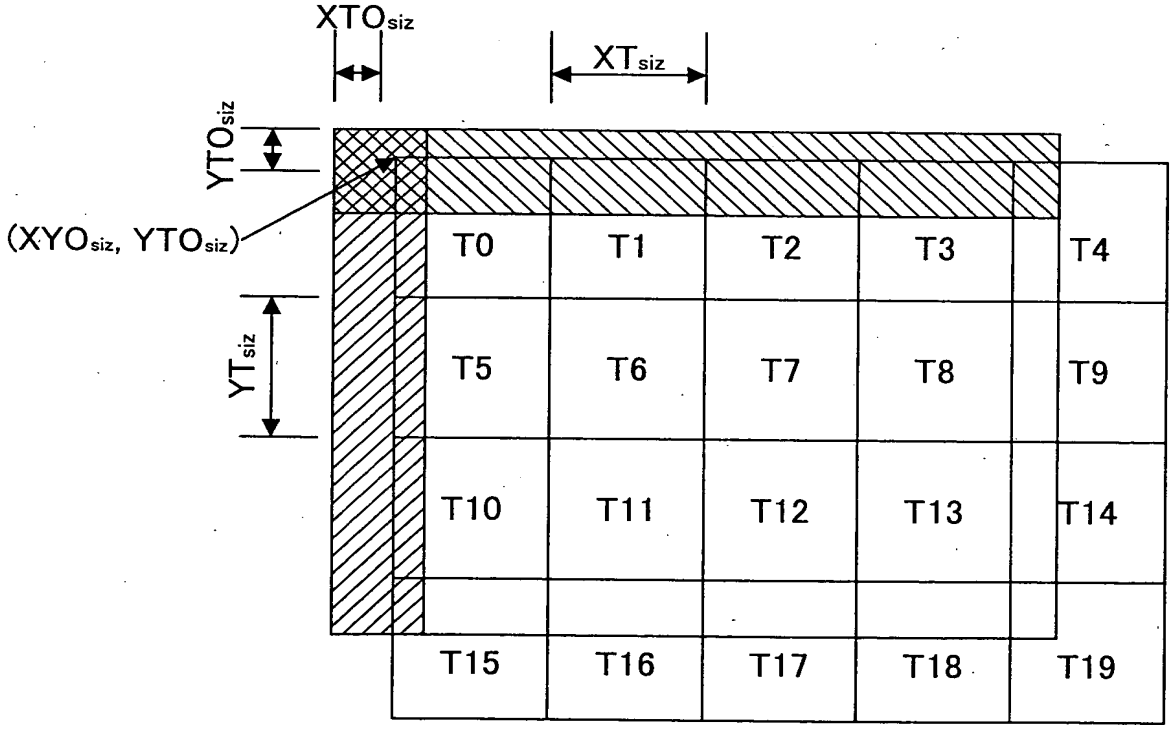

XTOsiz
XTsiz
YTOsiz
(XYOsiz, YTOsiz)
YTsiz
T0
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
T13
T14
T15
T16
T17
T18
T19

FIG.15

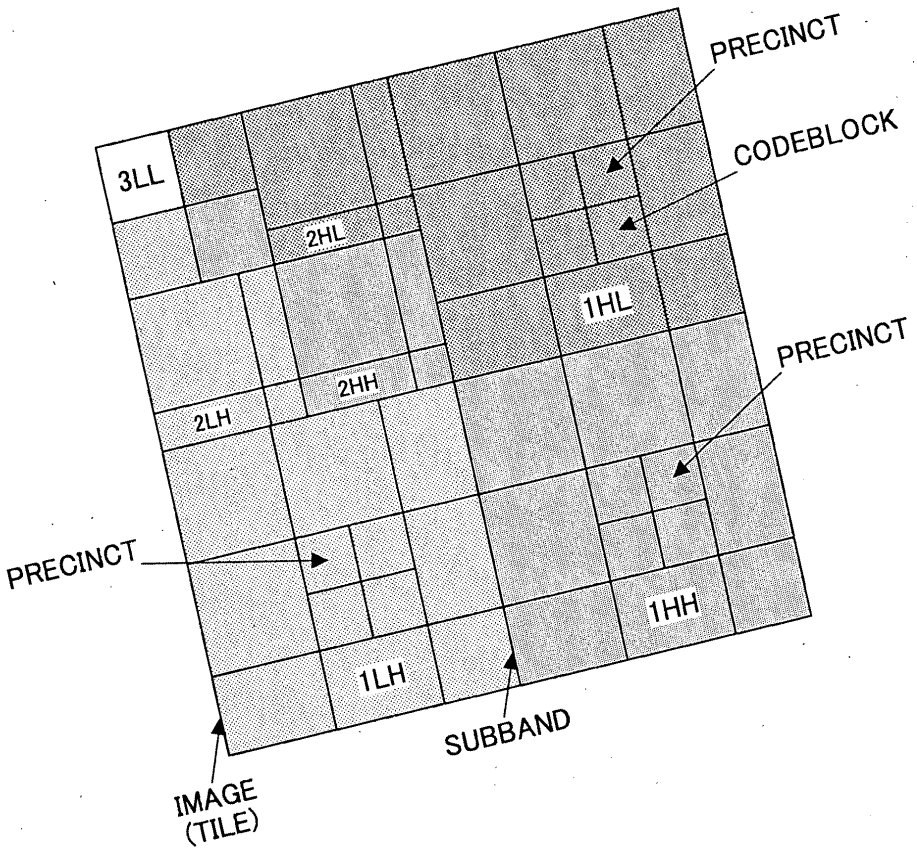

PRECINCT
CODEBLOCK
3LL
2HL
1HL
PRECINCT
2HH
2LH
PRECINCT
1HH
1LH
SUBBAND
IMAGE
(TILE)

FIG.16

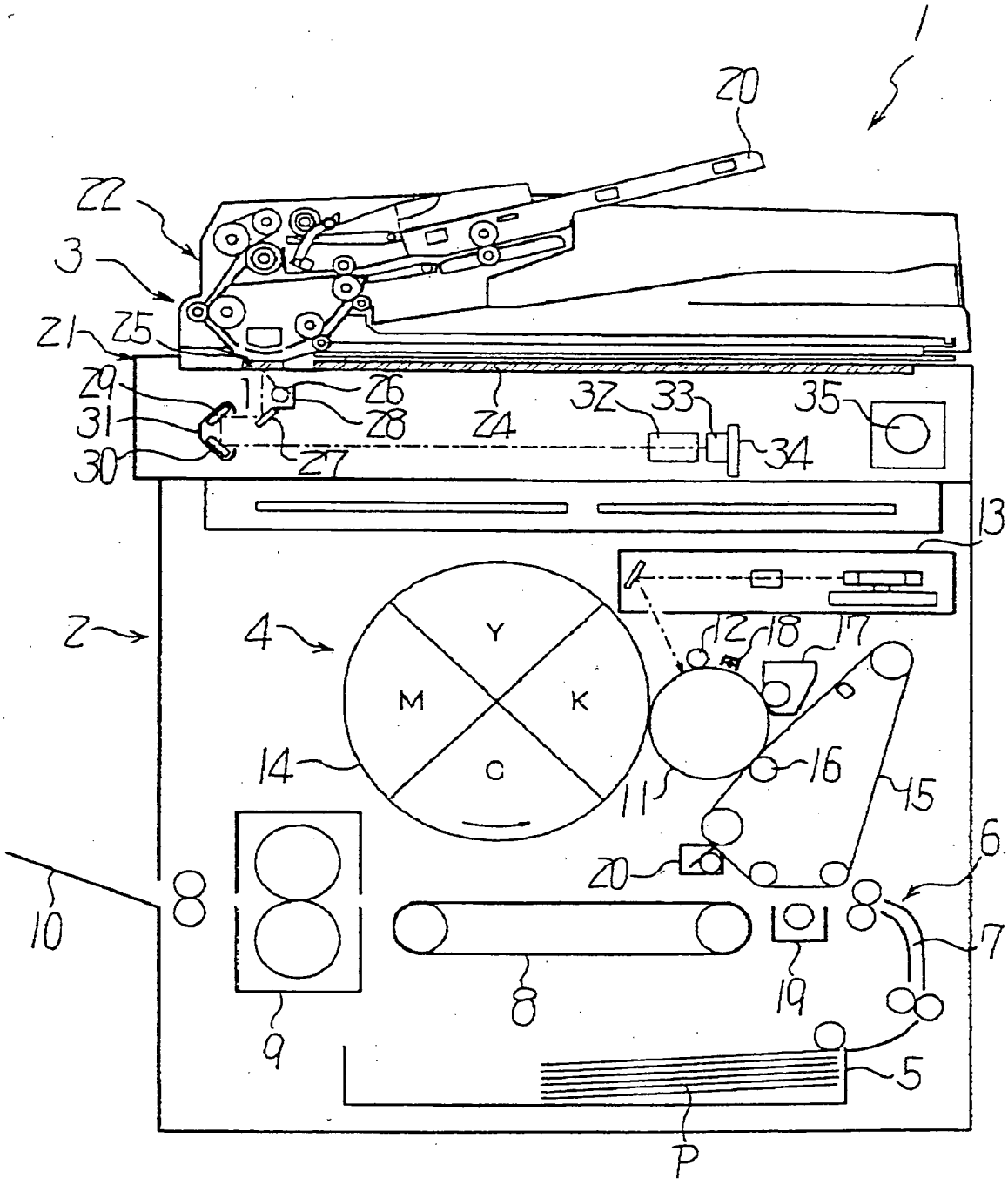

1
20
22
3
21
25
29
31
30
26
28
27
24
32
33
34
35
13
2
4
Y
M
K
C
14
12
18
17
16
11
15
6
10
8
19
7
9
5
P

FIG.17

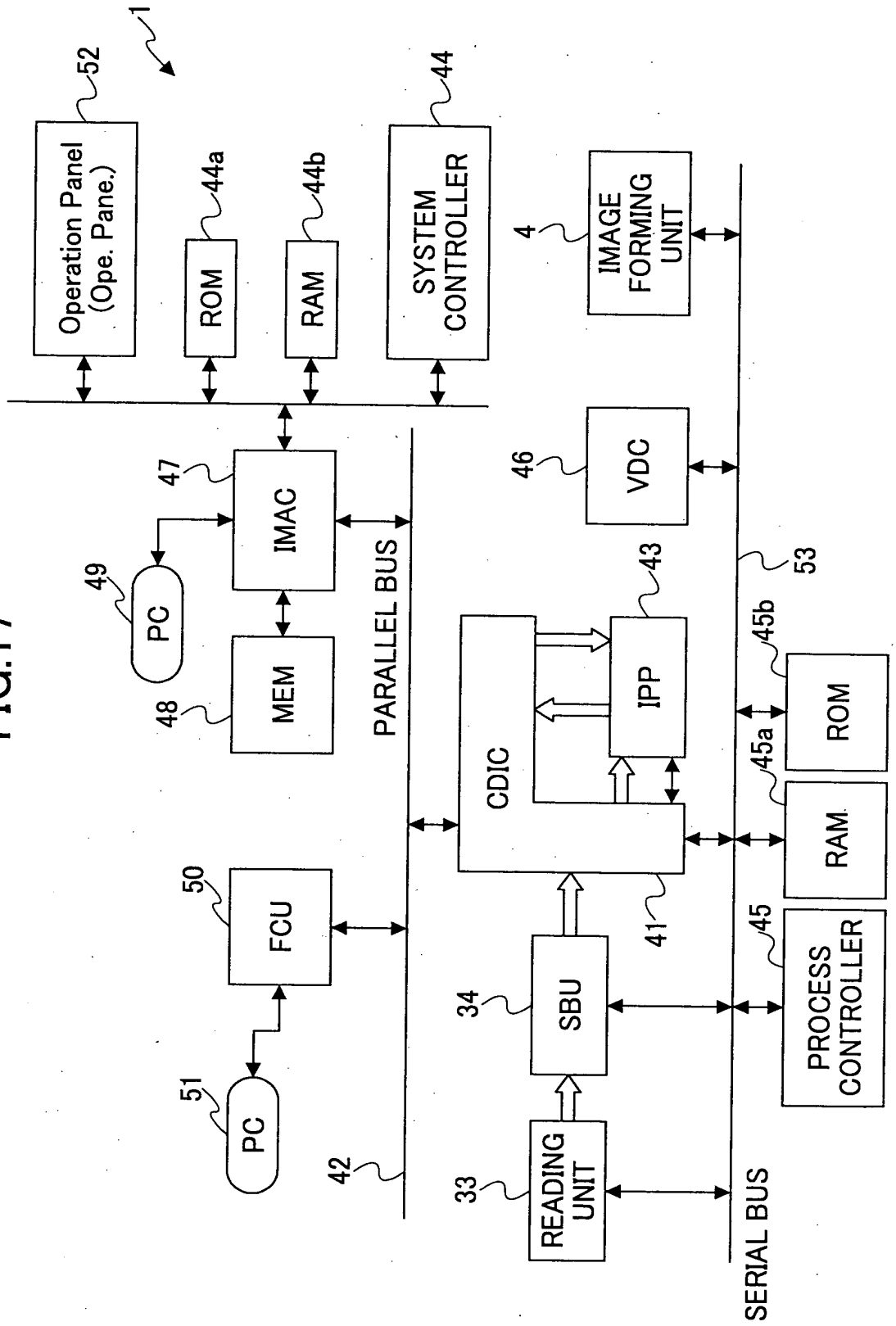

1
52
Operation Panel (Ope. Pane.)
44a
ROM
44b
RAM
44
SYSTEM CONTROLLER
4
IMAGE FORMING UNIT
47
IMAC
46
VDC
49
PC
48
MEM
PARALLEL BUS
43
53
45b
CDIC
IPP
ROM
45a
RAM
50
FCU
41
45
PROCESS CONTROLLER
34
SBU
51
PC
42
33
READING UNIT
SERIAL BUS

FIG.18

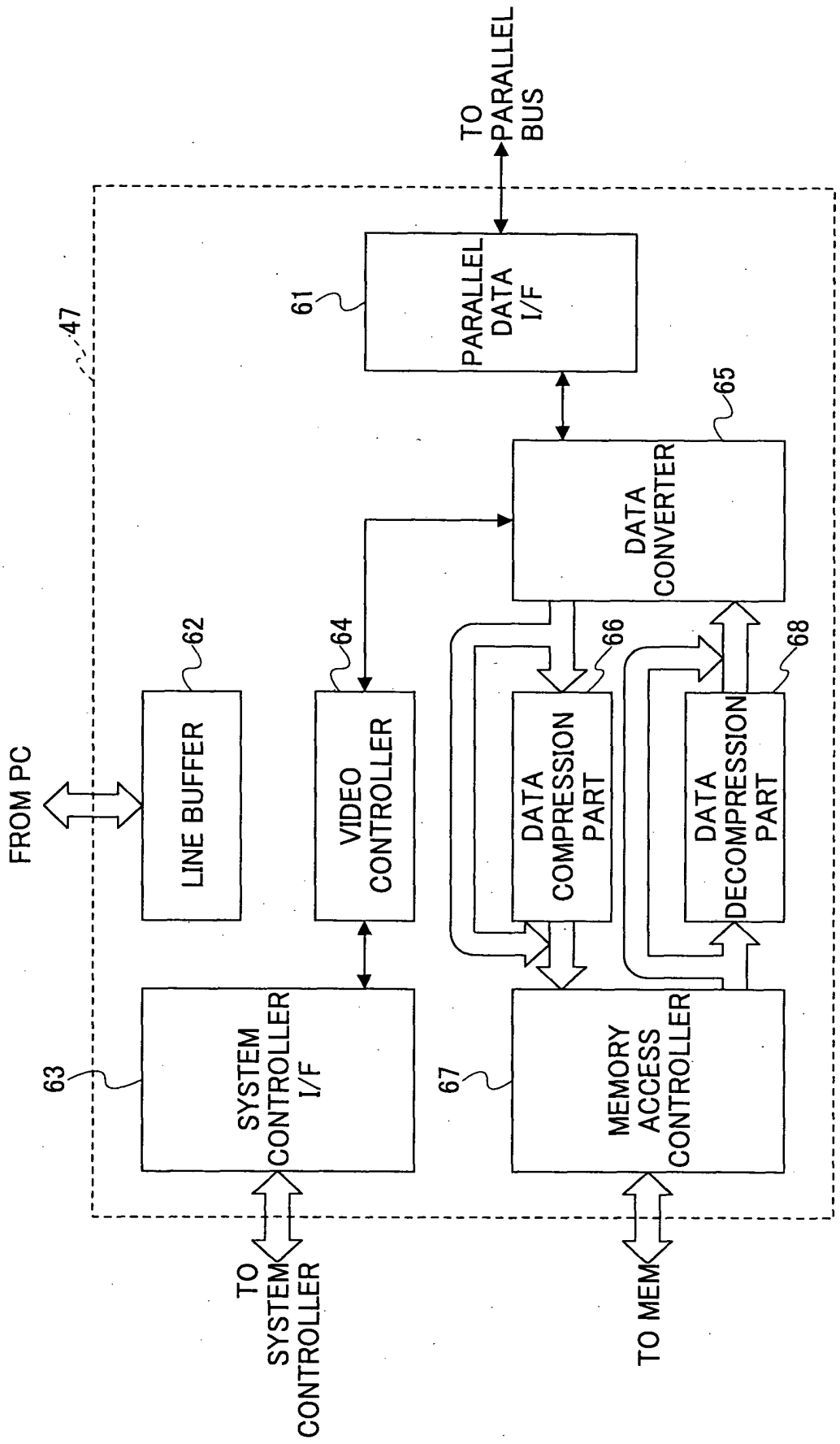

TO PARALLEL BUS
47
61
PARALLEL DATA I/F
65
DATA CONVERTER
62
64
66
68
FROM PC
LINE BUFFER
VIDEO CONTROLLER
DATA COMPRESSION PART
DATA DECOMPRESSION PART
63
67
SYSTEM CONTROLLER I/F
MEMORY ACCESS CONTROLLER
TO SYSTEM CONTROLLER
TO MEM

FIG.19

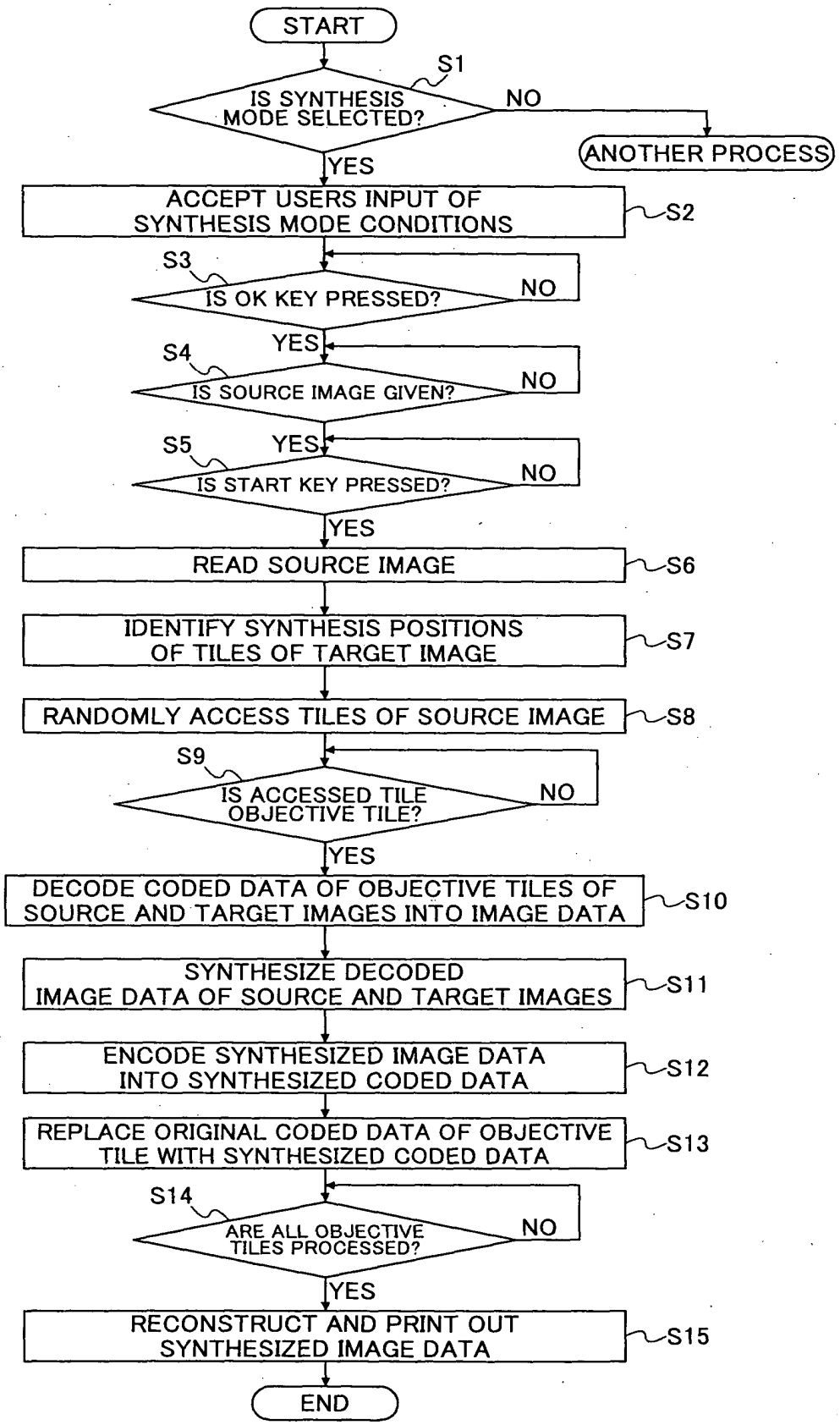

START
S1
IS SYNTHESIS MODE SELECTED?
NO
ANOTHER PROCESS
YES
ACCEPT USERS INPUT OF SYNTHESIS MODE CONDITIONS
S2
S3
IS OK KEY PRESSED?
NO
YES
S4
IS SOURCE IMAGE GIVEN?
NO
YES
S5
IS START KEY PRESSED?
NO
YES
READ SOURCE IMAGE
S6
IDENTIFY SYNTHESIS POSITIONS OF TILES OF TARGET IMAGE
S7
RANDOMLY ACCESS TILES OF SOURCE IMAGE
S8
S9
IS ACCESSED TILE OBJECTIVE TILE?
NO
YES
DECODE CODED DATA OF OBJECTIVE TILES OF SOURCE AND TARGET IMAGES INTO IMAGE DATA
S10
SYNTHESIZE DECODED IMAGE DATA OF SOURCE AND TARGET IMAGES
S11
ENCODE SYNTHESIZED IMAGE DATA INTO SYNTHESIZED CODED DATA
S12
REPLACE ORIGINAL CODED DATA OF OBJECTIVE TILE WITH SYNTHESIZED CODED DATA
S13
S14
ARE ALL OBJECTIVE TILES PROCESSED?
NO
YES
RECONSTRUCT AND PRINT OUT SYNTHESIZED IMAGE DATA
S15
END

FIG.20A SOURCE IMAGE

TA01	TA02	TA03	TA04	TA05
TA06	TA07	TA08	TA09	TA10
TA11	TA12	TA13	TA14	TA15
TA16	TA17	TA18	TA19	TA20

FIG.20B TARGET IMAGE

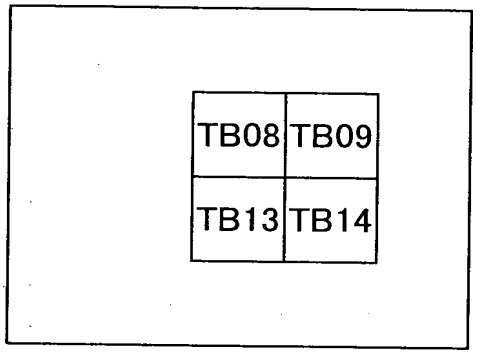


FIG.20C

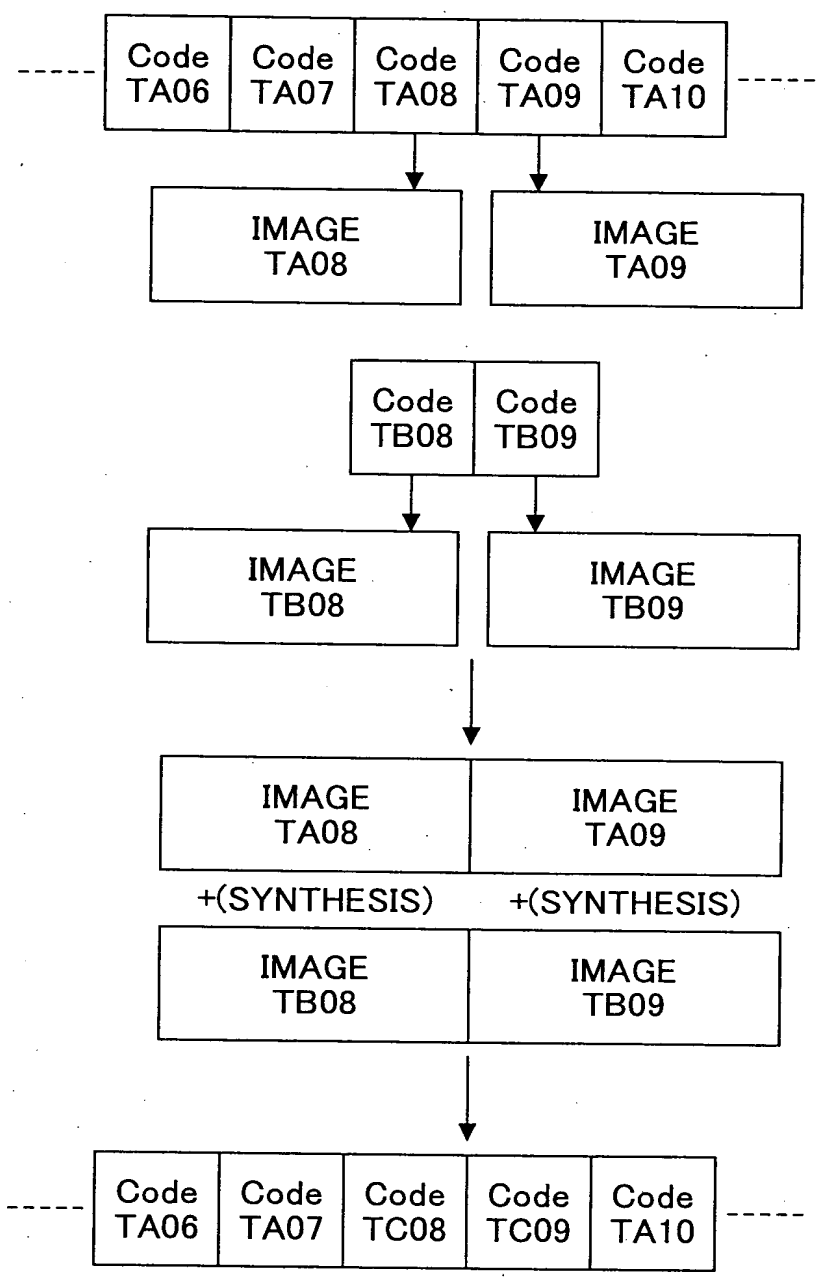

Code TA06
Code TA07
Code TA08
Code TA09
Code TA10
IMAGE TA08
IMAGE TA09
Code TB08
Code TB09
IMAGE TB08
IMAGE TB09
IMAGE TA08
IMAGE TA09
+(SYNTHESIS)
+(SYNTHESIS)
IMAGE TB08
IMAGE TB09
Code TA06
Code TA07
Code TC08
Code TC09
Code TA10

FIG.21

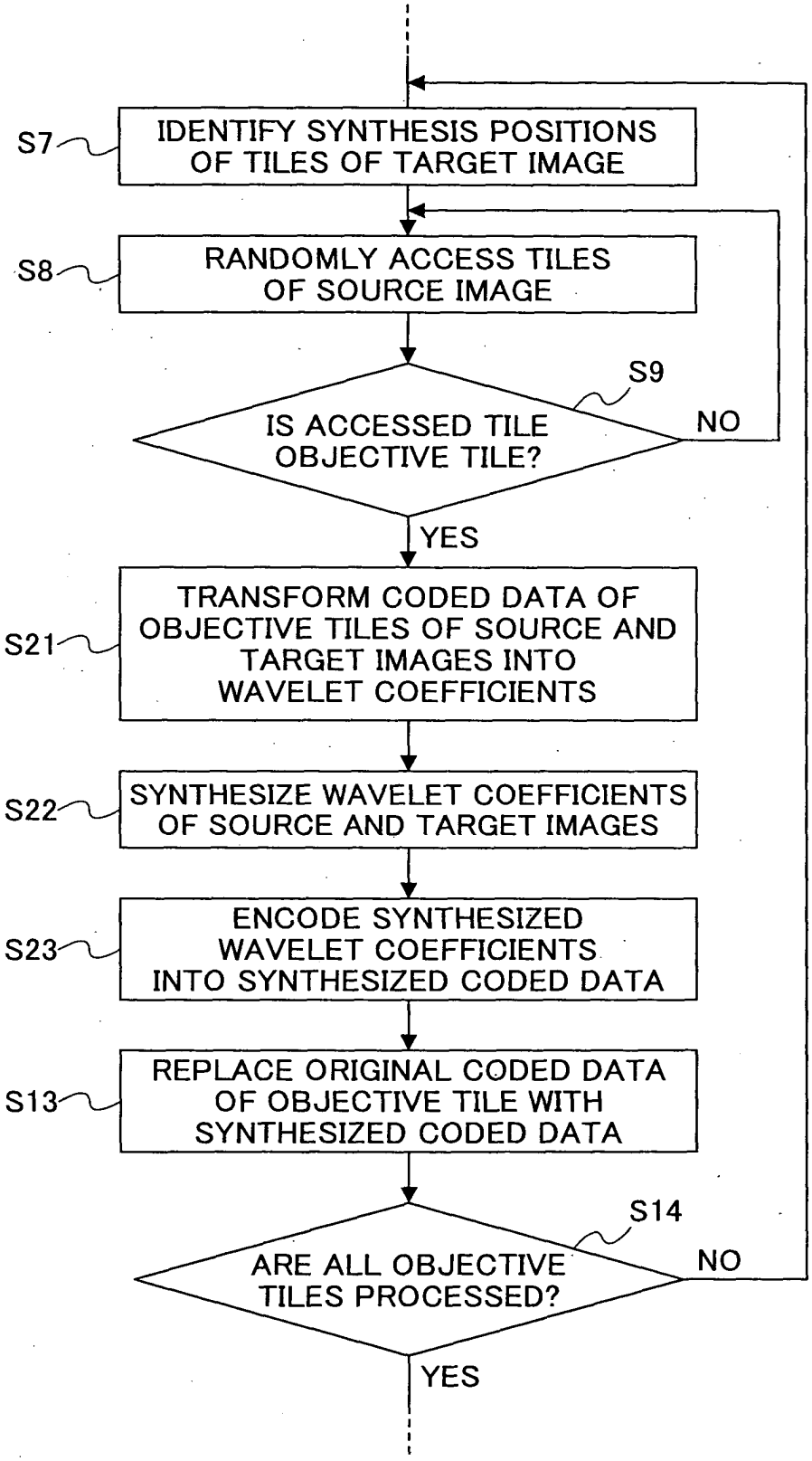

S7
IDENTIFY SYNTHESIS POSITIONS OF TILES OF TARGET IMAGE
S8
RANDOMLY ACCESS TILES OF SOURCE IMAGE
S9
IS ACCESSED TILE OBJECTIVE TILE?
NO
YES
S21
TRANSFORM CODED DATA OF OBJECTIVE TILES OF SOURCE AND TARGET IMAGES INTO WAVELET COEFFICIENTS
S22
SYNTHESIZE WAVELET COEFFICIENTS OF SOURCE AND TARGET IMAGES
S23
ENCODE SYNTHESIZED WAVELET COEFFICIENTS INTO SYNTHESIZED CODED DATA
S13
REPLACE ORIGINAL CODED DATA OF OBJECTIVE TILE WITH SYNTHESIZED CODED DATA
S14
ARE ALL OBJECTIVE TILES PROCESSED?
NO
YES

FIG.22A SOURCE IMAGE

TA01	TA02	TA03	TA04	TA05
TA06	TA07	TA08	TA09	TA10
TA11	TA12	TA13	TA14	TA15
TA16	TA17	TA18	TA19	TA20

FIG.22B TARGET IMAGE

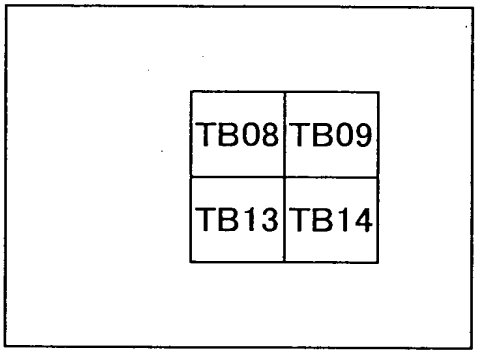


FIG.22C

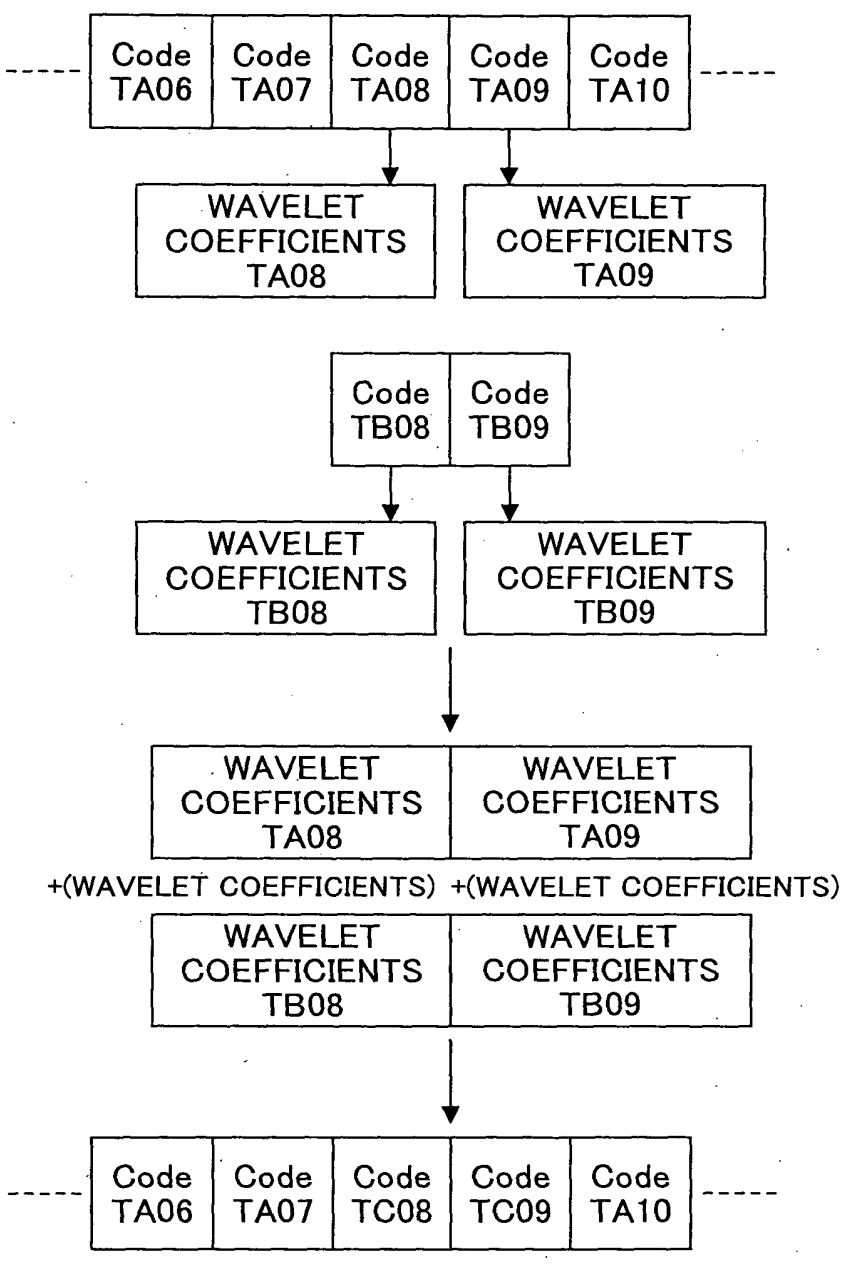

Code TA06
Code TA07
Code TA08
Code TA09
Code TA10
WAVELET COEFFICIENTS TA08
WAVELET COEFFICIENTS TA09
Code TB08
Code TB09
WAVELET COEFFICIENTS TB08
WAVELET COEFFICIENTS TB09
WAVELET COEFFICIENTS TA08
WAVELET COEFFICIENTS TA09
+(WAVELET COEFFICIENTS)
+(WAVELET COEFFICIENTS)
WAVELET COEFFICIENTS TB08
WAVELET COEFFICIENTS TB09
Code TA06
Code TA07
Code TC08
Code TC09
Code TA10

FIG.23

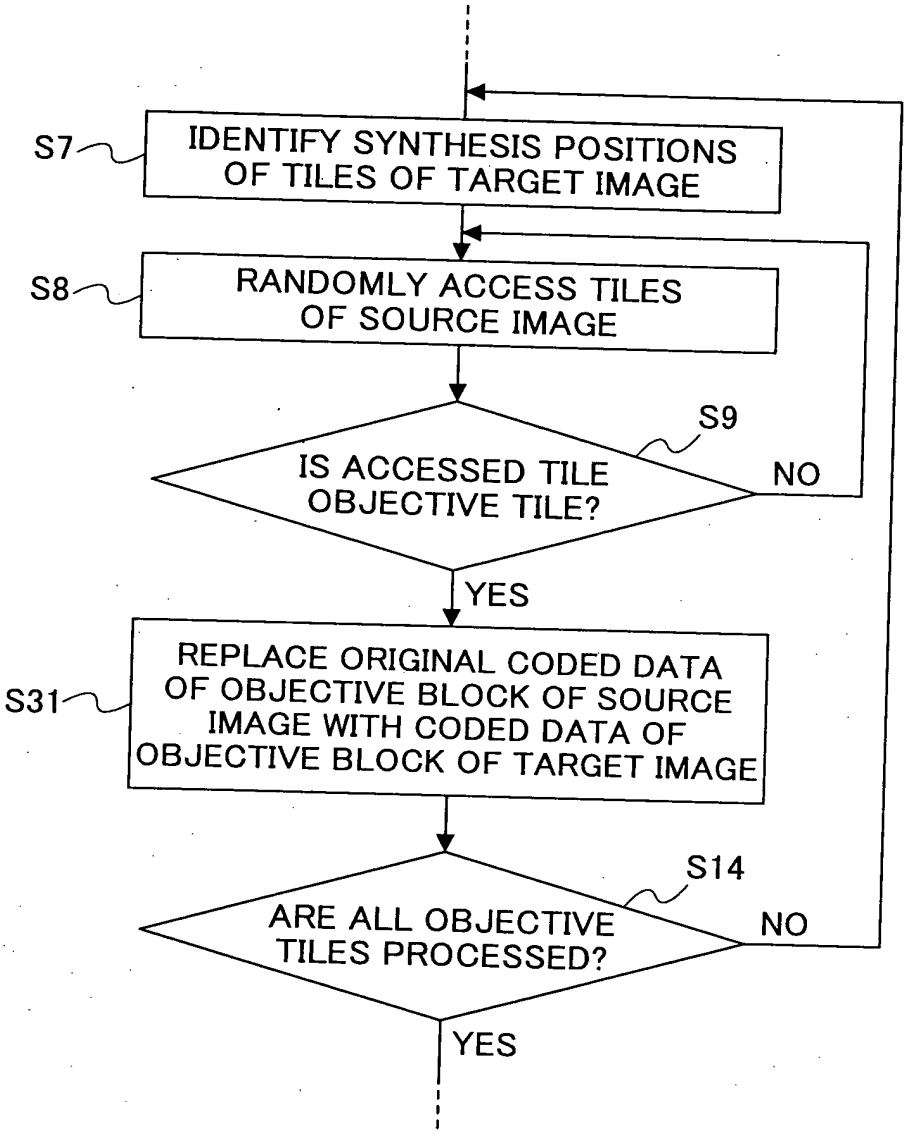

S7
IDENTIFY SYNTHESIS POSITIONS OF TILES OF TARGET IMAGE
S8
RANDOMLY ACCESS TILES OF SOURCE IMAGE
S9
IS ACCESSED TILE OBJECTIVE TILE?
NO
YES
S31
REPLACE ORIGINAL CODED DATA OF OBJECTIVE BLOCK OF SOURCE IMAGE WITH CODED DATA OF OBJECTIVE BLOCK OF TARGET IMAGE
S14
ARE ALL OBJECTIVE TILES PROCESSED?
NO
YES

FIG.24A SOURCE IMAGE

TA01	TA02	TA03	TA04	TA05
TA06	TA07	TA08	TA09	TA10
TA11	TA12	TA13	TA14	TA15
TA16	TA17	TA18	TA19	TA20

FIG.24B TARGET IMAGE

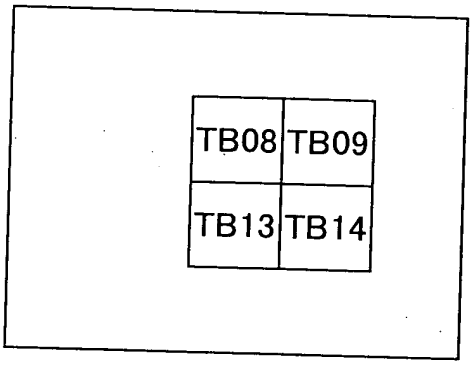
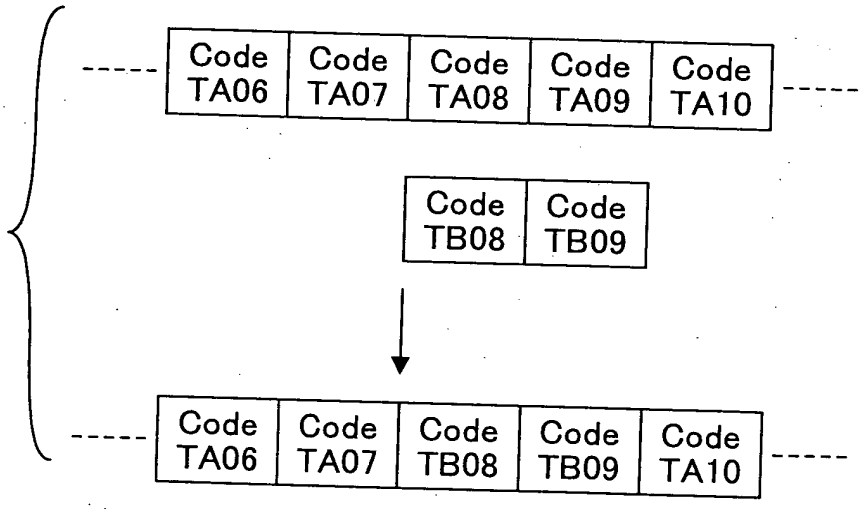



FIG.24C